GENERAL NOTES

James Oliver Mulvey.—James Oliver Mulvey was born in Madison, Indiana, November 5, 1868. He graduated from the Wichita High School and was one of the earlier students of the Lewis Academy of that city.

From early boyhood he showed a strong aptitude for mechanics and chemistry, a bent which he followed thru life. After spending his youth in his own shop at home and then in other active establishments where his naturally inventive genius was sharpened, he became connected with the mechanical department of the Armour Institute in Chicago. Here he acquired, largely by association, a considerable knowledge of physics, particularly optics. He became associated with Albert B. Porter in the Scientific Shop which had attained a substantial footing when Porter's untimely death put an end to the undertaking. Mulvey had charge of the practical side of the business, and it was there I first met him when on my way to Argentina in 1909. Porter spoke in the highest terms of his ability and we discussed to some extent plans for a great reflector for the Córdoba Observatory in regard to which I was then seeking information. Some months after reaching Córdoba I received a letter from Mulvey, telling me of Porter's sudden death and offering his services in connection with our proposed undertaking here. Needless to say it was an unusual opportunity for us, and as soon as plans could be completed (requiring about a year) Mulvey purchased the equipment of machines and supplies for a high-class mechanical shop of medium size and brought them to Córdoba in the latter part of 1910. He installed our shops and at once began the work of improving the efficiency of our instruments.

The first piece of work was typical of our difficulties and of the great need for well-equipped shops. A new measuring-engine for measuring the astrographic plates had been ordered and arrived from Europe at the same time as the shop equipment. In fact, all came to the observatory on the same day. Upon opening the box containing the measuring-engine it was found that the inside case

had been *inverted* in the outer, that the repacking at the custom-house had been careless, and in consequence a machine which was *marked* and planned to be carried right-side up always, as the carriage was not protected against inversion, was in nearly its original number of pieces, with handfuls of screws either sheared off or loose in the case. At first sight it looked almost hopeless. But after hurriedly setting up a lathe and drill press, Mulvey in a week's time had the measuring-engine ready for use, the important slides having escaped serious damage—how is still a mystery.

The list of things accomplished by Mulvey is too long to give in any detail. It must suffice to mention only the most important. Improved holding system for the objective of the astrographic telescope to eliminate distortion; improvements in bearings and in the driving system; remounting of both 12-inch equatorial and astrographic telescopes in new domes; regrinding pivots of old meridian-circle which had become much worn; pneumatic holder for curving films for curved-plate camera; and a good equipment of eclipse apparatus. In 1912, preparations were commenced for the work of making the optical parts of the great reflector. These included the construction of an underground optical shop and testing tunnel, three grinding and polishing machines, and the many incidental appliances for testing, etc. All of this work was directly under his charge.

A ruling-engine was also constructed and a Michelson interferometer for testing its screw and end-thrust.

At the time of his death he had concluded the grinding of the 30-inch and was figuring it to a spherical surface for the testing of the 36-inch flat. This latter was ground and polished and the first tests by means of a smaller plane had been made. The rough grinding of the 61-inch disk was in progress.

He designed and constructed the chief apparatus for the observation of total solar eclipses and took part in two expeditions from this observatory—the one to Brazil in October, 1912, and to Russia in 1914, showing great ability for such work.

Perhaps one of his most important contributions was a very efficient system of escapement which he first used in the driving-

clocks for the eclipse instruments. This escapement is such that it can be used in any position, the rate can be altered without stopping the clock and all parts are compact and almost completely protected against dust or rain. It is simple, sturdy, stands rough handling well and appears to be as accurate and dependable as any system I have seen. The same system has been adapted to our astrographic telescope, where it has been found to be a great improvement for the arduous work of the chart.

His mind was ever active in seeking greater efficiency; he had the true scientific concentration, knowing no such thing as holidays or definite hours of labor. His inventive faculties were bold and independent, and he had many good ideas covering a wide range of necessities which lack of time alone prevented attacking. He possessed good business ability, but his interest in scientific work was above everything else.

After his return from Russia he had a severe attack of gastric fever and required hospital attendance for about two months. He had recovered from that and also from ptomaine poisoning encountered on a trip into the hills to recuperate, and on the eve of leaving the hospital the second time, March 31st last, was stricken with apoplexy, dying almost instantly.

His services and his example have been of the greatest value to the observatory. The quantity and quality of the work in more than one branch are better owing to his efforts. His work in connection with the great reflector has been of great importance and the excellence of the results which are confidently expected from its use will be due in considerable measure to his efforts. It is, therefore, unfortunate that he could not have lived to reap the credit for his labor, which was the kind which makes for solid improvement without being spectacular.

C. D. PERRINE.

OBSERVATORIO NACIONAL ARGENTINO,
Córdoba, December 15, 1915.

Movement for the Abolition of the Fahrenheit Thermometer.—There have been many attempts during the past quarter century

to do away with the rather cumbrous system of weights and measures used in England and the United States, and to substitute the decimal system with its manifest advantages. The use of the metric system is now all but universal in the world of science, but, while its theoretical superiority is willingly admitted by the world of commerce and manufactures, it seems evident that the actual change from the foot to the meter as a unit is still a long way in the future in most English-speaking countries, largely because of the enormous capital at present tied up in machines, tools, taps, dies, jigs, templates, and gauges based upon the English inch.

The same objections apply with much less force to the proposition to do away with the Fahrenheit thermometric scale, and the bill at present before the House of Representatives, introduced by Hon. Albert Johnston, is almost unanimously regarded by scientists as a step in the right direction. The provisions of the bill are as follows:—

1. That the centigrade scale of temperature measurement shall be the standard in United States Government publications, the use of the Fahrenheit scale being discontinued at the option of heads of departments or other independent branches of the government, either immediately upon the signing of this bill, or at any time before January 1, 1920, except as provided in Section 3.

2. During the period of transition the Fahrenheit equivalent of centigrade degrees may be added in parentheses or as a footnote or in any other way, if in the opinion of heads of departments or independent officers it seems necessary.

3. The use of the Fahrenheit scale shall be permitted after January 1, 1920, in cases where it is required by State or municipal law, or in certificates of tests of instruments graduated in the Fahrenheit scale.

It is to be hoped that the bill may become a law.

Dr. F. Henroteau, of the Brussels Observatory, has been appointed Visiting Assistant Astronomer in the Observatory of the University of Michigan, on a salary provided by Mr. R. P. Lamont of Chicago. Since the outbreak of the European war Dr. Henroteau has been at the Stonyhurst College Observatory, at Blackburn, England. He is expected in Ann Arbor soon. (*Pop. Astronomy*, March, 1916.)

Total Solar Eclipse of February 3, 1916.—An expedition to observe this eclipse was sent to Tucacas, Venezuela, by the Argentine National Observatory at Córdoba. The expedition was in charge of astronomer Chaudet and was equipped with two cameras for photographing the corona, two prismatic cameras for the flash spectrum and coronal spectrum, a small slit spectrograph and a photometer.

A cablegram received by the Harvard College Observatory on February 9th announces that the Argentine expedition observed the total solar eclipse thru thin clouds. (*Pop. Astronomy,* March, 1916).

The Gold Medal of the Royal Astronomical Society has been awarded to Dr. J. L. E. Dreyer for his contributions to astronomical history and his catalogs of nebulæ.

The Hébert Prize of the Paris Academy of Sciences has been awarded to Professor M. I. Pupin, of Columbia University, for his theoretical and experimental researches in electricity.

Sir F. W. Dyson, English Astronomer Royal, has been elected a corresponding member of the Petrograd Imperial Academy of Sciences.

Dr. Mary M. Hopkins has been appointed associate professor of astronomy at Smith College.

Among the awards granted by the Paris Academy of Sciences in the first distribution of the Loutreuil Foundation are the following: To M. Gonessiat, director of the Algiers Observatory, 3,000 francs for the construction of an apparatus designed to measure

the intensity of Hertzian waves and for a vertical seismograph; and to Camille Flammarion, 3,000 francs, for his private observatory at Juvisy.

The Paris Academy has made a grant of 4,000 francs from the Bonaparte Fund to C. Le Morvan, assistant astronomer at the Paris Observatory, for the publication of a systematic and photographic map of the Moon.

Of the prize awards made by the Paris Academy in 1915, those in astronomy are as follows:—

The Lalande Prize was awarded to Lucien D'Azambuja, for his important contribution to the daily measurement of the upper layer of the solar atmosphere and to the recognition of the action exercised by the magnetic field on band spectra; the Valz Prize was awarded to Armand Lambert, for his work as an observer and in applied mathematics; the de Pontecoulant Prize was given to Louis Fabry, for his researches on the asteriods; no award of the Pierre Guzman Prize was made. (*Nature,* January 13, 1916.)

A Terrestrial Crater of the Lunar Type.—Altho the original memoir by Barringer on this subject was read before the United States National Academy some six years ago, many of our readers to whom the original publication may not be accessible will find the brief account of this formation given in *Nature* for January 27, 1916, very interesting reading. Coon Butte, the crater in question, is located in northern Arizona about two and a half miles from Cañon Diablo, famous for its innumerable scattered meteorites, and is a depression about four thousand feet in diameter, with a rim that rises nearly six hundred feet above the floor. A photograph of the crater and a cross-section diagram are given in the article, together with a resumé of the investigations which have been made to explain its origin. For Coon Butte is unique in that it forms perhaps the sole example on the surface of the Earth of a crater of the true lunar type, and is accordingly of great in-

terest in connection with the various theories that have been advanced as to the origin of the lunar craters, whether by volcanic action or by impact of enormous meteors. All the available evidence seems to indicate that Coon Butte is the result of impact, as there is absolutely no evidence of volcanic activity. The only difficulty in accepting the theory of impact in the case of Coon Butte is the question as to what has become of the vast mass of meteoric matter which caused the crater. Only scattered fragments of nickel-iron have been detected at the depths reached by the borings, and the existence of a vast mass of meteoric iron at greater depths finds no confirmation in the magnetic observations carried on in and around the butte.

It is evident that the striking characters of this singular "crater" are of no less interest to astronomers—so suggestive are the characters in which it agrees with the vast lunar craters—than to geologists, who up to the present have been chiefly attracted by the phenomenon.